Long-Travel Lift Stages

PRO-SV

Superior Precision, Long Travel, Low-Profile

With a minimum step size of 10 nm, our PRO-SV stages are the most precise screw-driven lift stages available—plus they offer the longest travel range available at the shortest height. They're also the only long-travel lift stages that can move up to 100 kg of mass while providing excellent payload accessibility and geometric performance.

Key Applications

PRO-SV stages are ideal for height-restricted applications or situations when multiple positioning stages are stacked, including:

- Synchrotron & beamline sample manipulation
- Wafer inspection
- Surface metrology
- Laser microprocessing
- Precision manufacturing

KEY FEATURES:

- Supports **100 kg LOAD CAPACITY,** with up to **50 mm TRAVEL** and **20 mm/s MAXIMUM SPEED**
- Delivers **EXCELLENT STRAIGHTNESS & ANGULAR PERFORMANCE** thanks to high-precision crossed-roller bearings
- Achieves **10 nm STEP SIZE** by combining precision-ground ball-screw, slotless torque motor & low-expansion linear encoder
- Provides long service life thanks to **HIGH-RELIABILITY DRIVE MECHANISM**
- **INTEGRATES SEAMLESSLY** with PRO-SL and PRO-LM linear stages
- Offers ThermoComp® for **CONSISTENT PERFORMANCE** in changing environments

PRO-SV SPECIFICATIONS

Specifications		PRO165SV-020	PRO190SV-035	PRO225SV-050
Travel		20 mm	35 mm	50 mm
Accuracy[1]	**Standard**	±4 µm	±5 µm	±6 µm
	Calibrated	±0.75 µm		
	Calibrated, with Linear Encoder	±0.5 µm		
Resolution (Min. Incremental Motion)	**With Rotary Encoder**[2][8]	0.025 µm		
	With Linear and Rotary Encoder[3][8]	0.010 µm		
Bidirectional Repeatability[1]	**With Rotary Encoder**[2]	±0.5 µm		
	With Linear and Rotary Encoder[3]	±0.15 µm		
Straightness[1]		±3 µm	±4 µm	±5 µm
Pitch		50 µrad (10 arc sec)	58 µrad (12 arc sec)	73 µrad (15 arc sec)
Roll		50 µrad (10 arc sec)	58 µrad (12 arc sec)	73 µrad (15 arc sec)
Yaw		50 µrad (10 arc sec)	58 µrad (12 arc sec)	73 µrad (15 arc sec)
Maximum Speed[4]		10 mm/s		20 mm/s
Load Capacity[5][6]		20 kg	40 kg	100 kg
Stage Mass[7]		5.4 kg	10.2 kg	17.8 kg
Material		Anodized aluminum		

1. Certified with -PL1/-PL2 options.
2. With 1 Vpp amplified sine rotary encoder (-E1 feedback option).
3. With 1 Vpp amplified sine linear encoder (-E3, -E4 feedback options).
4. Requires the selection of an appropriate amplifier with sufficient voltage and current.
5. Axis orientation for on-axis loading is listed.
6. A holding brake (-BK option) is recommended when the payload exceeds 75% of the load capacity (for PRO165SV and PRO190SV), or 45 kg (for PRO225SV), as a precaution in the event that power to the stage is unexpectedly lost.
7. Excludes tabletop and brake options.
8. With linear amplifier.
9. Specifications are for single-axis systems measured 25 mm above the tabletop. Performance of multi-axis systems depends on payload and workpoint. Consult factory for details.

Electrical Specifications		PRO165SV-020	PRO190SV-035	PRO225SV-050
Drive System		Brushless torque motor		
Feedback	**Rotary**	Incremental encoder, 1 Vpp Digital encoder, RS422 10,052 lines/rev (PRO165SV, PRO190SV) or 14,452 lines/rev (PRO225SV)		
	Linear	Incremental encoder, 1 Vpp with 20 µm scale Digital encoder, RS422 with 0.25 µm resolution Absolute encoder, EnDat 2.2 with 0.001 µm resolution		
Maximum Bus Voltage		340 VDC		
Limit Switches		5 V, normally-closed		

PRO-SV ORDERING OPTIONS

PRO-SV Long-Travel Lift Stage

PRO165SV-020 PRO165SV mechanical-bearing, ball-screw lift stage, 20 mm travel
PRO190SV-035 PRO190SV mechanical-bearing, ball-screw lift stage, 35 mm travel
PRO225SV-050 PRO225SV mechanical-bearing, ball-screw lift stage, 50 mm travel

Feedback (Required)

-E1 Rotary incremental encoder, 1 Vpp
-E2 Rotary incremental encoder, digital RS-422
-E3 Direct linear encoder, 1 Vpp + rotary encoder, 1 Vpp (dual-loop)
-E4 Direct linear encoder, 1 Vpp + rotary encoder, digital RS-422 (dual-loop)
-E7 Absolute linear encoder + rotary encoder, 1 Vpp (dual-loop)

Tabletop (Optional)

-TT3 Accessory tabletop with mounting for select rotary stages

Brake (Optional)

-BK Holding brake
Note: The holding brake option is recommended when the payload exceeds 75% of the load capacity as a precaution in the event that power to the stage is unexpectedly lost.

ThermoComp (Optional)

-TCMP ThermoComp integrated thermal compensation

Lifting Hardware (Optional)

-LF Hoist rings
Note: Only available with PRO190SV and PRO225SV.

Metrology (Required)

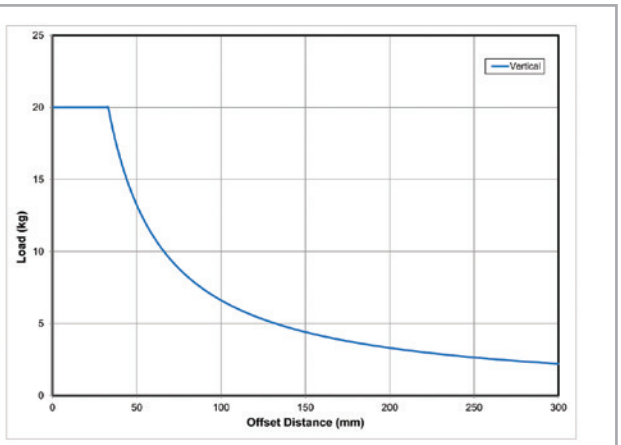
-PL0 No metrology performance plots
-PL1 Metrology, uncalibrated with performance plots
-PL2 Metrology, calibrated (HALAR) with performance plots

Integration (Required)

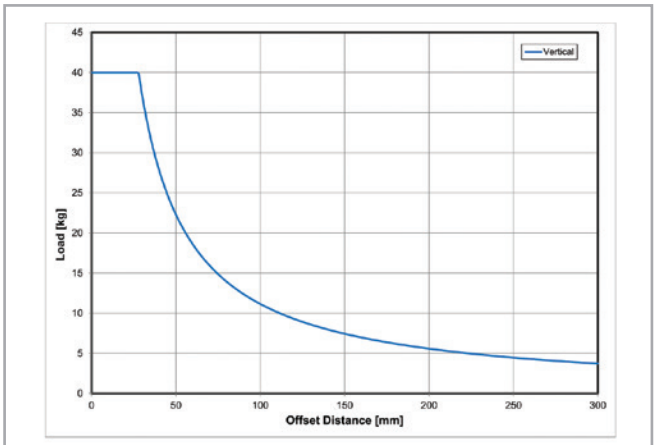
Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required or if you desire custom integration support with your system.

-TAS **Integration - Test as system**
Testing, integration and documentation of a group of components as a complete system that will be used together (ex: drive, controller and stage). This includes parameter file generation, system tuning and documentation of the system configuration.

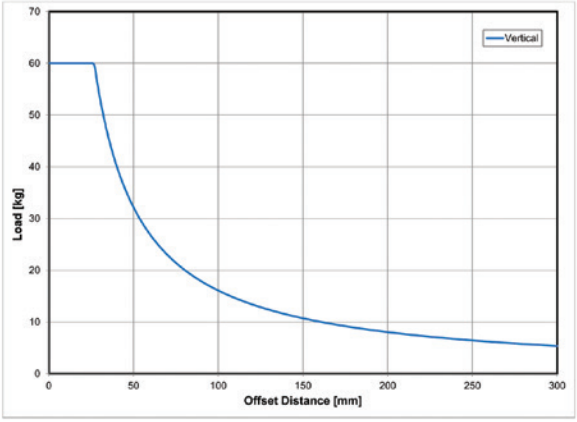
-TAC **Integration - Test as components**
Testing and integration of individual items as discrete components. This is typically used for spare parts, replacement parts or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.



Cantilevered load capability of PRO165SV-020.



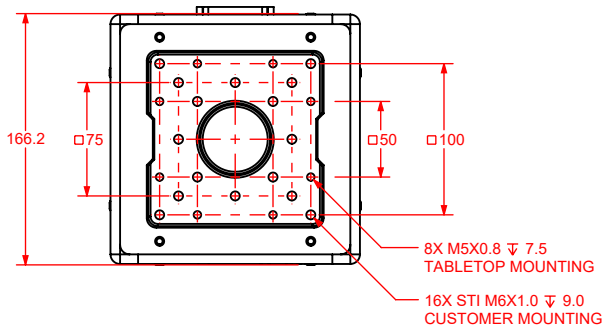
Cantilevered load capability of PRO190SV-035.

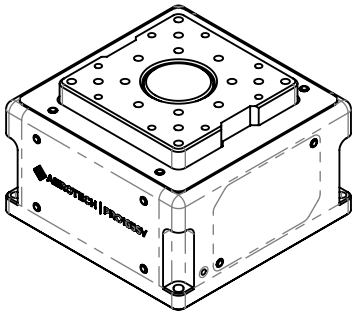


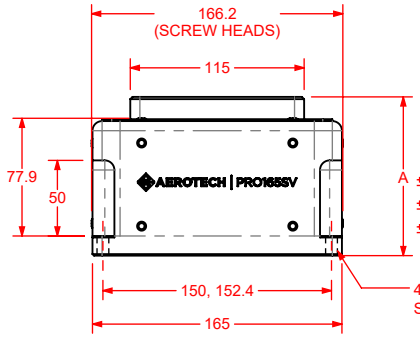
Cantilevered load capability of PRO225SV-050.

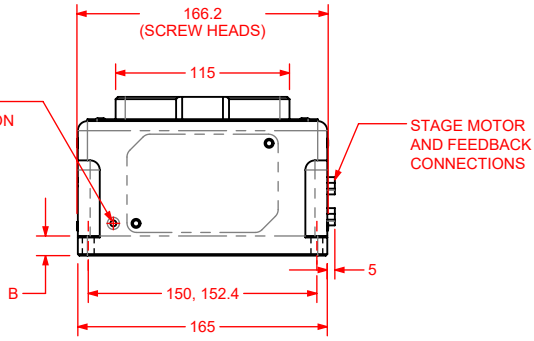
PRO-SV DIMENSIONS

PRO165SV-020

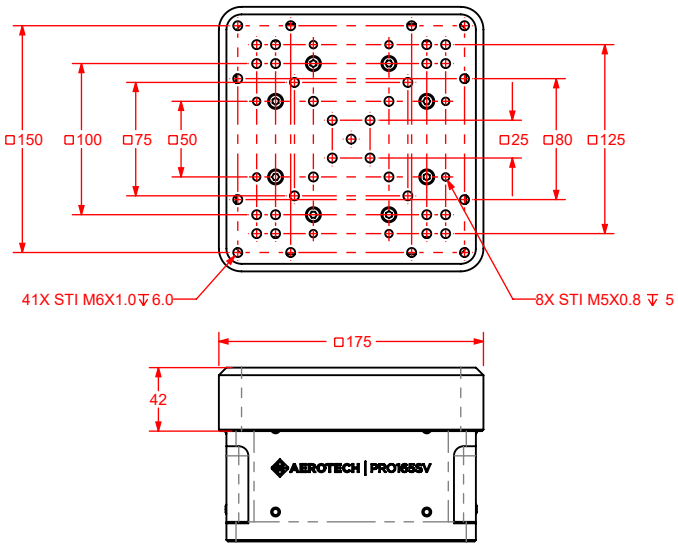








OPTIONAL ACCESSORY TABLETOP
-TT3



MODEL	A	B
PRO165SV-020	105	13
PRO165SV-020-TT3	115	13
PRO165SV-020-BK	120	28
PRO165SV-020-TT3-BK	130	28

-TT3 MOUNTS THE FOLLOWING 1.		
ADRS	ADRT	AGR
100	150	75
150		100

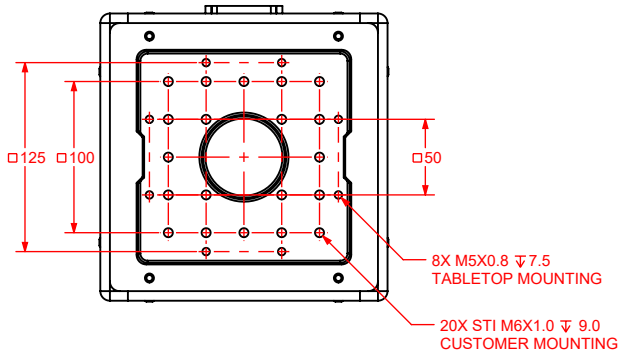
NOTE:

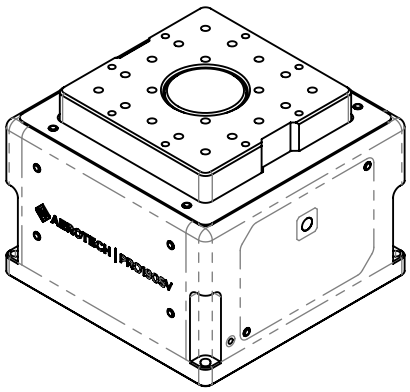
1. SIDE MOUNTING NOT SUPPORTED.

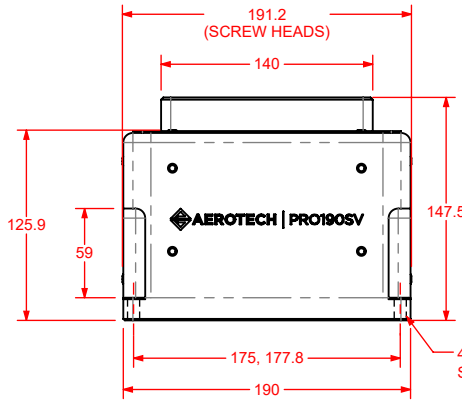
DIMENSIONS: MILLIMETERS

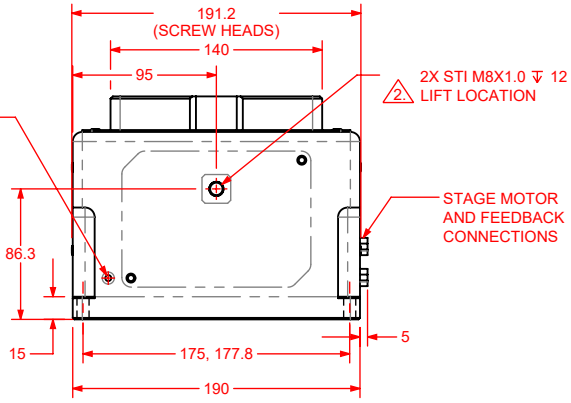
PRO-SV DIMENSIONS

PRO190SV-035

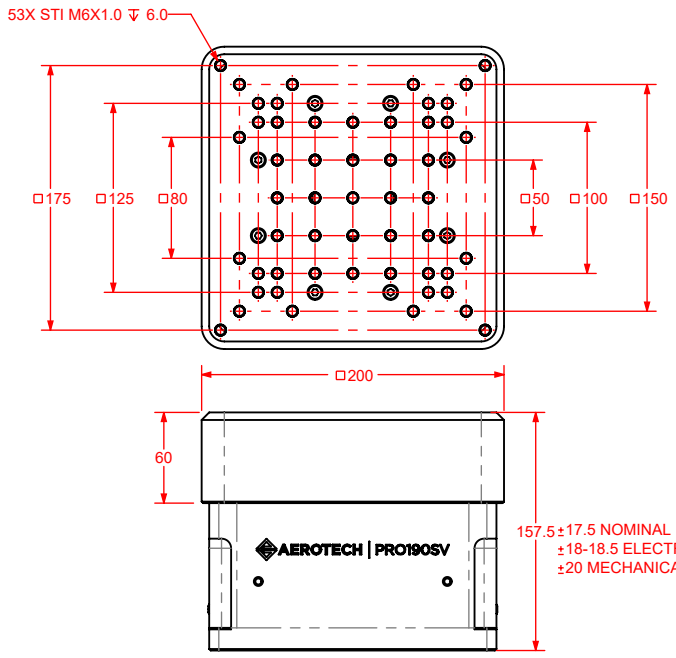








OPTIONAL ACCESSORY TABLETOP
-TT3



-TT3 MOUNTS THE FOLLOWING 1.		
ADRS	ADRT	AGR
150	150	100
200		

NOTE:

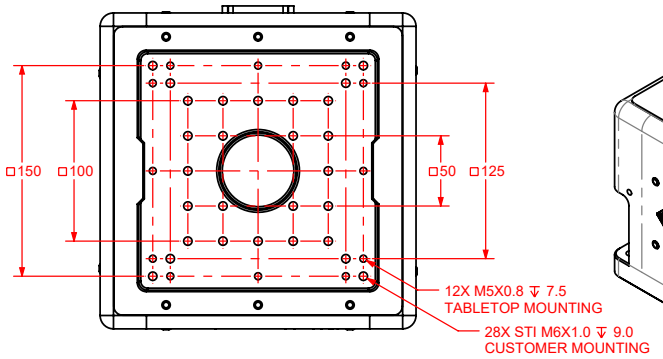
1. SIDE MOUNTING NOT SUPPORTED.

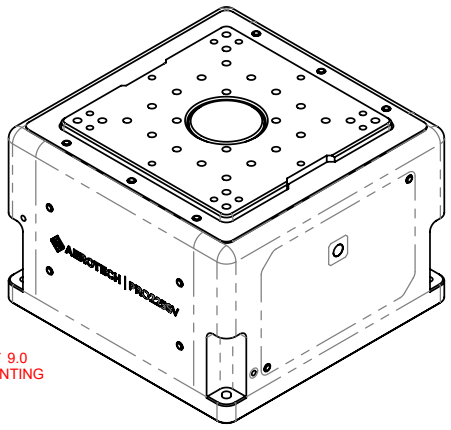
2. IF -TT3 AND -LF OPTIONS ARE SELECTED, TABLETOP MUST BE REMOVED TO ACCESS LIFT LOCATIONS.

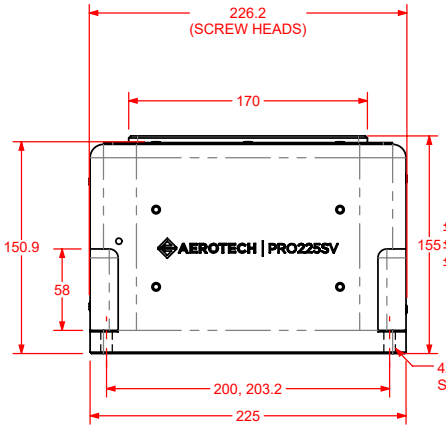
DIMENSIONS: MILLIMETERS

PRO-SV DIMENSIONS

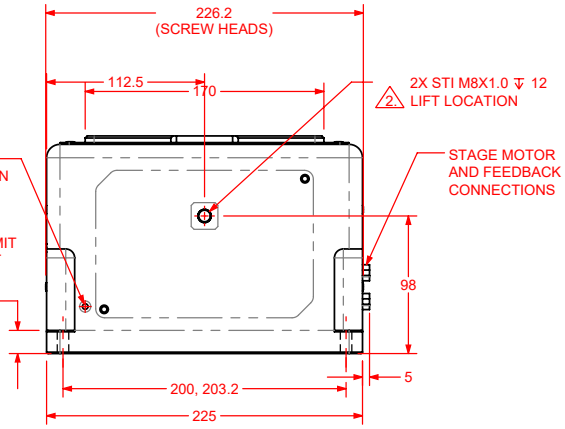
PRO225SV-050

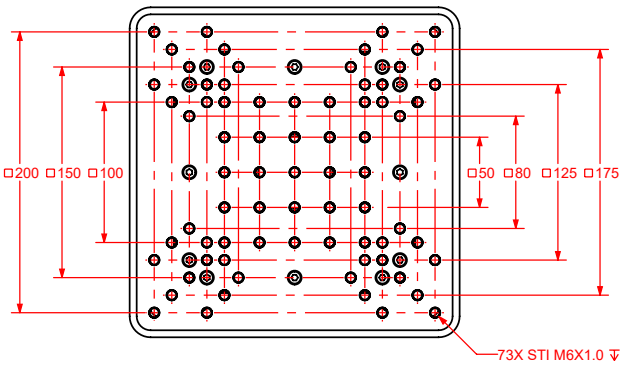


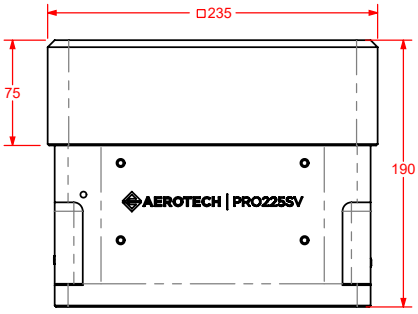




OPTIONAL ACCESSORY TABLETOP
-TT3







-TT3 MOUNTS THE FOLLOWING 1.				
ADRS	ADRT	AGR	ALAR	CCS190DR
-150	-150	100	-100-SP	-240
-200		150	-100-LP	-260

NOTE:

1. SIDE MOUNTING NOT SUPPORTED.

2. IF -TT3 AND -LF OPTIONS ARE SELECTED, TABLETOP MUST BE REMOVED TO ACCESS LIFT LOCATIONS.

DIMENSIONS: MILLIMETERS